

REMARKS

The Office Action indicates that only claims 1-7, 10, 25-33, 35, 51 and 55 are pending in this application. *See* in the Office Action at page 1, and on page 2 at line 4. However, Applicants respectfully submit that claims 52 and 56 are also pending and under prosecution. Claims 52 and 56 have not been canceled by Applicants. Indeed, the Office Action acknowledges those claims were amended in Applicants previous response filed August 5, 2004. *See* in the Office Action at page 2, lines 3-4. Nor have those claims been withdrawn from consideration, *e.g.*, as directed to non-elected subject matter. To the contrary, the previous Office Action, which was mailed on February 6, 2004, specifically states that claims 55 and 56 are joined to Group I. *See* in the Office Action dated February 6, 2004, at the last line on page 6. Group I is the invention group elected, with traverse, for prosecution in this application. *See*, Applicants' Response to Restriction Requirement mailed on November 6, 2003 for this application. *See also*, in the February 6, 2004 Office Action at page 2, lines 8-11 (acknowledging Applicants' election of Group I with traverse). Therefore, claims 1-7, 10, 25-33, 35, 51-52 and 55-56 are currently pending and under prosecution in this application.

Claims 1-4, 25-28, 51 and 55 have been amended, *supra*, without admission or disclaimer. New claims 103-106 have been introduced. Hence, claims 1-7, 10, 25-33, 35, 51-52, 55-56 and 103-106 will be pending after entry of these amendments.

Independent claims 1, 25, 51 and 55 have been amended to more particularly specify that detection of the elevated level of CAP43 identifies the cell or tissue as cancerous, and diagnoses an individual from whom the cell or tissue is obtained as having cancer. Support for this amendment can be found within the general description of such methods in Section 5.6.1 starting at page 45, line 7 of the application as filed. *See*, in particular, at page 45, lines 17-20. Claims 1 and 25 have also been amended to particularly specify that the CAP43 "gene product" is a polypeptide having an amino acid sequence at least 70% identical to the sequence recited in those claims (*i.e.*, SEQ ID NO:2). Applicants note that this limitation was originally recited in dependent claims 3 and 27. Accordingly, those dependent claims have been amended, to cancel that recitation. Dependent

claims 3 and 27 now recite a CAP43 polypeptide specifically comprising the human CAP43 amino acid sequence set forth in SEQ ID NO:2.

Dependent claims 2 and 26 have also been amended, to cancel the first alternative recited in those claims (*i.e.*, of a nucleic acid specifically comprising the human CAP43 nucleotide sequence set forth in SEQ ID NO:1). That embodiment is now recited in new dependent claims 103 and 104, which depend from claims 2 and 26, respectively. Dependent claims 4 and 28 have been amended to more clearly specify that the CAP43 “gene product” is a polypeptide.

Finally, claims 51 and 55 have been amended in order to more particularly recite preferred embodiments of the invention that is the subject matter of this application. In particular, these independent claims now specify that the CAP43 gene product comprises the particular amino acid sequence set forth in FIG. 1B and in SEQ ID NO:2. New claims 105 and 106 have also been added. These new claims depend from claim 51 and 55, respectively, and specify that the CAP43 polypeptide is encoded by a nucleic acid comprising the particular nucleotide sequence recited in those claims (SEQ ID NO:2).

The new and amended claims therefore do not introduce any new matter to this application. Instead, these amendments render the claims in condition for allowance or in better form for consideration on appeal. Entry and consideration of these amendments are therefore respectfully requested.

**A. The Rejections Under 35 U.S.C. § 112
Should Be Withdrawn**

The Examiner has maintained the previous rejection of the pending claims as failing to comply with the written description requirement of 35 U.S.C. § 112, first paragraph. In particular, the Examiner asserts that this application fails to adequately describe structural features or other relevant identifying characteristics of a CAP43 polypeptide.

In response, Applicants reiterate that, contrary to what is stated in the Office Action, the features of CAP43 proteins and nucleic acids that are relevant to this invention are fully described in

this application as filed, and in sufficient detail that a person of ordinary skill in the art would appreciate that the Applicants were then in possession of their claimed invention. For example, the application as filed makes it clear that CAP43 is a polypeptide comprising an amino acid sequence with at least 70% sequence identity to the exemplary human CAP43 amino acid sequence depicted in Figure 1B and in SEQ ID NO:2 of the application. *See* in the application as filed, at page 24, line 23 through page 25, line 6. The application as filed also explains that such CAP43 polypeptides can be encoded by a nucleic acid that is at least 70% identical to and/or hybridizes to the complement of the exemplary, full-length human CAP43 nucleic acid sequence presented both in Figure 1A and in SEQ ID NO:1 of the application. *Id.* at page 26, lines 8-20. Moreover, the application identifies the particular functional characteristics of CAP43 that are relevant to the present invention. In particular, Applicants have discovered that the CAP43 polypeptides and nucleic acids of this invention are expressed at elevated levels in cancer cells. *Id.* at page 41, line 28 to page 42, line 5.

While Applicants submit that these identifying features and properties of CAP43 are made clear by the specification as filed, Applicants have nevertheless amended the claims, without prejudice or disclaimer, so that these features and properties are particularly recited. Specifically, independent claims 1 and 25 have both been amended to particularly specify that the CAP43: (a) comprises an amino acid sequence at least 70% identical to the exemplary human CAP43 amino acid sequence in Figure 1B (SEQ ID NO:2), and (b) is expressed at elevated levels in cancer cells. Applicants note, moreover, that claims 51 and 55 particularly specify the preferred human CAP43 amino acid sequence set forth in Figure 1B. New dependent claims 103-106 particularly specify that the CAP43 is encoded by the preferred full-length, human CAP43 nucleotide sequence shown in Figure 1B (SEQ ID NO:1). Hence, the amended claims now specifically recite the particular identifying features and properties of CAP43 that have always been described in this application as filed.

Hence, the claimed subject matter is adequately described and this application complies with the written description requirement. Applicants therefore respectfully request that the rejection under 35 U.S.C. § 112, first paragraph, be withdrawn.

**B. The Rejection Under 35 U.S.C. § 102(e)
Should Be Withdrawn**

The previous rejection for anticipation under 35 U.S.C. § 102(e) has also been maintained. In particular, the pending claims remain rejected as anticipated by U.S. Patent No. 6,376,169 by Adams *et al.* (the “Adams ‘169 patent” or “Adams”). This patent describes a gene that it calls RTP/DRG/Ndr1, which is supposedly identical to the amino acid sequence set forth in this application for CAP43. According to the Office Action, “Adams specifically states that the diagnostic methods of the [Adams patent] include the diagnosis of cancer.” *See* in the Office Action at page 5, lines 13-14.

Anticipation requires that each and every element of the rejected claim(s) be disclosed in a single prior art reference. *See* M.P.E.P. § 2131 (8th Ed. Rev. 2, May 2004). “A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Every element of the claimed invention must literally present, arranged as in the claim. *Perkin Elmer Corp. v. Computervision Corp.*, 732 F.2d 888, 894, 221 USPQ 669, 673 (Fed. Cir. 1984). In the present instance, the relevant question is whether the Adams ‘169 patent describes (a) detecting elevated expression of a CAP43 gene product in cells or tissue, and (b) identifying the cells or tissue as cancerous by virtue of the elevated expression.

Although the Office Action asserts that “Adams specifically states that the diagnostic methods of the [Adams patent] include the diagnosis of cancer” (*see* in the Office Action at page 5, lines 13-14), it does not cite to any specific statement or passage within that patent for support. In fact, the Adams ‘169 patent contains no such statement. Rather, the Adams ‘169 patent teaches (at col. 7, lines 19-23) that its invention:

“relates to methods for diagnosing hypoxia, endothelial dysfunction or a vascular condition or circulatory condition, such as a condition associated with a reduction in blood flow and/or oxygen delivery within an anatomical site or system.”

Adams states (at col. 7, lines 43-50) that the “[v]ascular, circulatory or hypoxic conditions to which the diagnostic methods of [Adams’ alleged] invention apply are those associated with, but not limited to, ... cancer” However, the Adams ‘169 patent then goes on to explain that its alleged invention “contemplates the diagnosis of altered vasculature such as reduced vascularity resulting in hypoxia within tumors.” See in the Adams ‘169 patent at col. 8, lines 25-27. According to Adams (at col. 8, lines 27-40):

Tumor hypoxia is correlated with a poor prognosis in cancer patients, and ... reduces the efficacy of treatments such as chemotherapy and radiation therapy.... Such transient hypoxia is also one example of a condition under which potential for metastasis of cancer cells, or the degree to which cells are invasive, may be increased. Thus the invention also relates to a method of assessing an individual’s risk for metastasis.

Adams then goes on to state that “genes which undergo a change in expression, such as an up-regulation of expression, in response to a hypoxic condition include gene RTP/Drg1.” See in the Adams ‘169 patent at col. 9, lines 16-25.

Hence, the Adams ‘169 patent actually describes, at best, a method for identifying and/or diagnosing hypoxia by detecting up-regulation of the RTP/Drg1 gene. While the Adams ‘169 patent may state that such hypoxic conditions might somehow be relevant to cancer, it does not identify as cancerous any cell or tissue expressing elevated levels of RTP/Drg1, CAP43 or any other gene. Instead, the Adams ‘169 patent only teaches that its methods can be used to identify hypoxia in certain tumors, and that this, in turn, can be used to assess patient prognosis, treatment efficacy, or risk of metastasis.

In fact, the Adams ‘169 patent actually teaches away from the claimed invention of this application. Although Adams reports, in Example 3 of that patent (starting at col. 22, line 1) that RTP/Drg1 expression is up-regulated in breast tumor cells cultured *in vitro* under hypoxic conditions (1% O₂), the example also reports that cells grown under normal oxygen conditions (20% O₂) do not express the RTP/Drg1 gene. Hence, Adams actually suggests that the RTP/Drg1 gene is

only expressed in tumor cells under certain, specific conditions – namely under conditions of very low oxygen levels (*i.e.*, hypoxia).

The Examiner has argued that this point is irrelevant because “it is recognized in the art that there are many differences between cultured cells and their counterparts *in vivo* and the demonstration that cancer cells in culture under normal/nonhypoxic conditions do not over-express Drg1 is clearly a demonstration of those differences.” *See* in the Office Action at page 5, lines 14-18. Yet the Examiner provides no explanation, let alone any evidence, to show or demonstrate that this is the case. Indeed, the Examiner’s acknowledgement of these differences further demonstrate that the Adams ‘169 patent, which only describes the detection of RTP/Drg1 *in vitro*, in cultured tumor cells, cannot teach the presently claimed invention of identifying cells or tissue (including cells or tissue in a sample taken from an individual) as being cancerous.

In summary, the Adams ‘169 patent fails to teach each and every element recited in the claims of this application. As such, the claims therefore cannot be anticipated by that patent. Applicants therefore respectfully request that the rejection under 35 U.S.C. § 102(e) be withdrawn.

C. The Rejection Under 35 U.S.C. § 102(f) Has Been Obviated and Should Be Withdrawn

The Examiner has also maintained the previous rejection of this application under 35 U.S.C. § 102(f), as failing to name the correct inventor(s) of subject matter claimed in this application. This rejection is premised on a thesis Abstract by Hakan Cangul, purportedly describing the claimed invention. The Examiner has therefore suggested that Dr. Cangul may have made an inventive contribution to subject matter claimed in this application, and has rejected the application for not naming him as an inventor.

In response, Applicants note that a Petition to Correct Inventorship is submitted along with this Response, requesting that the inventorship of this application be corrected so that Hakan Cangul is added as a named co-inventor of the application. This Petition is fully compliant with the requirements of 37 C.F.R. § 1.48(a) for correcting inventorship in a nonprovisional application after

the oath or declaration has been filed. In particular, the Petition sets forth the desired inventorship change; namely to add Hakan Cangul as a named co-inventor. 37 C.F.R. § 1.48(a)(1). The Petition is also accompanied by a statement signed by Dr. Cangul, averring that the error in inventorship occurred without any deceptive intent on his part (37 C.F.R. § 1.48(a)(2)), and by a Substitute Declaration and Power of Attorney signed by each of the inventors Max Costa, Konstantin Salnikow, Herman Yee and Hakan Cangul (37 C.F.R. § 1.48(a)(3)). A written statement signed by an authorized officer of New York University, the assignee of this application, and consenting to the change of inventorship is also submitted pursuant to 37 C.F.R. § 1.48(a)(5). Finally, the required fee set forth in 37 C.F.R. § 1.17(i) also accompanies the Petition. 37 C.F.R. § 1.48(a)(4).

In view of the above, Applicants respectfully submit that the inventorship of this application should be amended to add the name of Hakan Cangul as a co-inventor. It is believed that this amendment to the inventorship obviates the rejection of this application under 35 U.S.C. § 102(f). Applicants therefore respectfully request that the rejection be withdrawn.

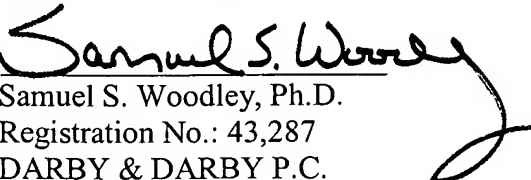
D. Conclusion

In view of the foregoing arguments, Applicants respectfully submit that this the amendments set forth in this response present the claims in better form for consideration on appeal. Each of the rejections to the pending claims has been overcome and/or obviated. Accordingly, the entry and consideration of the amendments and arguments presented here, and withdrawal of all rejections and objections to this application are respectfully requested. An allowance is eagerly sought.

Respectfully submitted,

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